

Claims

- [c1] 1. An IP phone with an assigned phone number capable of communicating over a packet-based communication protocol, said IP phone located behind a firewall, said communication device comprising:
- a. DHCP client software, upon an initial power up of said IP phone, communicating with said firewall to receive an IP address;
 - b. IP agent software, upon receiving said IP address from said firewall, registering with a DNS switch based upon at least the following parameters: said assigned phone number, said received IP address, a public IP address associated with said firewall, or a MAC address associated with said IP phone; and wherein, upon successful registration with said DNS switch, said IP agent software receives a port number and address over which future communications are to be performed.
- [c2] 2. An IP phone with an assigned phone number capable of communicating over a packet-based communication protocol, said port number accepts communication requests, as per claim 1, wherein said port connections are via any of the following protocols: Session Initiation Protocol (SIP) or Media Gateway Control Protocol (MGCP).
- [c3] 3. An IP phone with an assigned phone number capable of

communicating over a packet-based communication protocol, said port number accepts communication requests, as per claim 1, wherein said IP phone is additionally associated with a backup phone number whereby communications are forwarded to said backup phone number upon any disruptions in communication with said IP phone.

[c4] 4. An IP phone with an assigned phone number capable of communicating over a packet-based communication protocol, said port number accepts communication requests, as per claim 1, wherein said firewall runs an HTTP service and said public IP address associated with said firewall is obtained via a HTTP GET query.

[c5] 5. An IP phone with an assigned phone number capable of communicating over a packet-based communication protocol, said port number accepts communication requests, as per claim 1, wherein said communications between said IP agent and said DNS switch is via the TCP/IP protocol.

[c6] 6. An IP phone with an assigned phone number capable of communicating over a packet-based communication protocol, said port number accepts communication requests, as per claim 1, wherein said IP agent monitors and detects changes to said public IP address associated with said firewall; and upon detecting such a change, said IP agent identifies a new public IP address of said firewall and said reregisters with said

DNS switch based upon at least the following parameters: said assigned phone number, said received IP address, said identified new public IP address associated with said firewall, said MAC address associated with said IP phone.

[c7] 7. An IP phone with an assigned phone number capable of communicating over a packet-based communication protocol, said port number accepts communication requests, as per claim 6, wherein said IP agent monitors changes to said public IP address associated with said firewall at pre-set time intervals.

[c8] 8. An IP phone with an assigned phone number capable of communicating over a packet-based communication protocol, said port number accepts communication requests, as per claim 1, wherein said DNS switch is behind an Internet Service Provider (ISP) gateway.

[c9] 9. A method for facilitating a communication link between one or more IP phones located behind a first firewall and one or more IP phones behind a second firewall via a DNS switch, said method as implemented in said DNS switch comprising the steps of:

- a. receiving a request for an unique IP address from a first IP phone located behind said first firewall and a second IP phone located behind said second firewall;
- b. transmitting a unique IP address for to said first and second

IP phones;

c. receiving a request for registration from said first and second IP phones, each of said requests based upon at least the following parameters: a unique assigned phone number, a unique IP address, a public IP address associated with corresponding firewall, or a unique MAC address,

d. registering said first and second IP phones based upon said received parameters associated with each IP phone, and upon successful registration, transmitting a port number and address to said first and second IP phones over which future communications are to be performed, and

wherein a communication link is facilitated at said DNS switch between said first IP phone and second IP phone via said transmitted port number and address.

[c10] 10. A method for facilitating a communication link between one or more IP phones located behind a first firewall and one or more IP phones behind a second firewall via a DNS switch, as per claim 9, wherein said port number accepts communication requests via any of the following protocols: Session Initiation Protocol (SIP) or Media Gateway Control Protocol (MGCP).

[c11] 11. A method for facilitating a communication link between one or more IP phones located behind a first firewall and one or more IP phones behind a second firewall via a DNS switch, as per claim 9, wherein each of said IP phones are associated

with a backup phone number and said method additionally comprises the step of identifying disruptions in communication with either of said IP phones and forwarding communications addressed to a corresponding backup phone number.

[c12] 12. A method for facilitating a communication link between one or more IP phones located behind a first firewall and one or more IP phones behind a second firewall via a DNS switch, as per claim 9, wherein each of said firewalls run an HTTP service and said public IP address associated with each firewall is obtained via a HTTP GET query.

[c13] 13. A method for facilitating a communication link between one or more IP phones located behind a first firewall and one or more IP phones behind a second firewall via a DNS switch, as per claim 9, wherein each of said IP phones monitor and detect changes to said public IP address associated with their respective firewall, and upon detecting a new public IP address, said method comprises the additional step of reregistering IP phones based upon at least the following parameters: said assigned phone number, said received IP address, said identified new public IP address associated with said firewall, said MAC address associated with said IP phone.

[c14] 14. A method for facilitating a communication link between one or more IP phones located behind a first firewall and one or more IP phones behind a second firewall via a DNS switch, as

per claim 13, wherein changes in said public IP address associated with firewalls are monitored at pre-set time intervals.

[c15] 15. A method for facilitating a communication link between one or more IP phones located behind a first firewall and one or more IP phones behind a second firewall via a DNS switch, as per claim 9, wherein said DNS switch is behind an Internet Service Provider (ISP) gateway.

[c16] 16. An article of manufacture comprising a computer user medium having computer readable code embodied therein which facilitates communication between an IP phone with an assigned phone number capable of communicating over a packet-based communication protocol and a DNS switch, said IP phone located behind a firewall, said medium comprising:

- a. computer readable program code communicating with said firewall to receive an IP address,
- b. computer readable program code, upon receiving said IP address from said firewall, registering with a DNS switch based upon at least the following parameters: said assigned phone number, said received IP address, a public IP address associated with said firewall, a MAC address associated with said IP phone, and
- c. computer readable program code, upon successful registration with said DNS switch, receiving a port number and

address over which future communications are to be performed.

[c17] 17. An article of manufacture comprising a computer user medium having computer readable code embodied therein which facilitates communication between an IP phone with an assigned phone number capable of communicating over a packet-based communication protocol and a DNS switch, as per claim 16, wherein said medium further comprises computer readable program code forwarding communications to a backup phone number upon identifying any disruptions in communication with said IP phone.

[c18] 18. An article of manufacture comprising a computer user medium having computer readable code embodied therein which facilitates communication between an IP phone with an assigned phone number capable of communicating over a packet-based communication protocol and a DNS switch, as per claim 16, wherein said firewall runs an HTTP service and said public IP address associated with said firewall is obtained via a computer readable program code generated HTTP GET query.

[c19] 19. An article of manufacture comprising a computer user medium having computer readable code embodied therein which facilitates communication between an IP phone with an assigned phone number capable of communicating over a

packet-based communication protocol and a DNS switch, as per claim 16, wherein said medium further comprises computer readable program code for monitoring and detecting changes to said public IP address associated with said firewall, and upon detecting such a change, said computer readable program code identifying a new public IP address of said firewall and said reregistering with said DNS switch based upon at least the following parameters: said assigned phone number, said received IP address, said identified new public IP address associated with said firewall, said MAC address associated with said IP phone.

[c20] 20. An article of manufacture comprising a computer user medium having computer readable code embodied therein which facilitates communication between an IP phone with an assigned phone number capable of communicating over a packet-based communication protocol and a DNS switch, as per claim 19, wherein said medium further comprises a timer for monitoring changes to said public IP address associated with said firewall at pre-set time intervals.